Agriculture in a Machine Age

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IT is always a bit risky—though sometimes good fun—to challenge a popular belief, especially one that many people have come to rely upon as a substitute for religious faith. I am referring, of course, to the doctrine of human Progress, which postulates that every change is not merely inevitable but an advance on what has gone before. Farm mechanization has become an essential part of that doctrine. It has led urban, industrialized communities, who have long had a slightly guilty conscience in regard to their agricultures, to believe that, by ever-increasing use of machinery and technical " know-how," the land can be made to yield more and more food at less and less cost per unit of produce. Given this premise, it follows that there is no longer any need to worry about its continuing loss of workers or to take special measures to give those remaining economic security.

I am well aware that any such challenge exposes one to the charge of being a " reactionary," or even a " romanticist " or " sentimentalist "—whatever such epithets may mean. But it does seem to me that a body such as the Fellowship should not accept without examination criteria based primarily on chronological sequence and implicitly adopting industry and the big city as their norms. And it may help you to arrive at a truer assessment of the subject under discussion if I try to give you a brief survey of the situation, primarily as it affects this country and chiefly in the light of my own experience.

Such an assessment, to be just, must endeavour to present both sides to any question. I know, for instance, what real satisfaction can be derived from skilled manual work competently performed; but I also know what it is to spend week after week on the same job, hoeing roots, say, for nine hours a day in the same field. I could say much about the interest

and companionship that horses give to work, for I have spent much of my life among them; but I also know what misery it is to have to flog a tired team along at the end of a hard day. And while I have had some experience of the extent to which machinery can assist and lighten human labour, I am also familiar with the frustration as well as the loss of time and money, that occur when an important task is held up by some mechanical breakdown.

I do not think I am exaggerating when I say that the uncritical way in which farm mechanization is accepted is almost startling in its näivity. Even our more intelligent journals now use the words "mechanization" and "efficiency" as if they were virtually inter-changeable terms. This credulity seems to arise from a series of misconceptions, for which agriculturists themselves, I am afraid, are partly responsible.

The first is that agriculture is an industry, in the modern, customary sense of the word. It is true, of course, that ever since the Enclosures and the Industrial Revolution agriculture has been forced to evolve on lines broadly similar to those adopted in manufacturing; that is, capitalist entrepreneurs employing wage labour and machinery to produce goods for sale. Even so, most farms are operated on a strictly personal capital of only a few thousand pounds, and nearly half employ no regular wage labour. So it looks as if we had not moved very far from the peasant economy. Indeed, some of us think that we may eventually have to move back towards it again.

The most striking difference, however, is in the actual processes of production; for these are the work, not of men or of man-made machines, but of living plants, animals and soil organisms, whose natural increase the farmer cultivates—*i.e.* tends and harvests. This cultural function admittedly includes many relatively repetitious and mainly energetic tasks that can often be mechanized. But to assume that the machine itself produces, or that production can be increased simply by employing more mechanical power, is to ignore elementary biology. We have now, for instance, enough tractors to plough the entire surface of Britain in about a month; but we are still a long, long way from feeding ourselves. The

plough merely helps to prepare the ground for the plants that are to do the producing; and today there are farmers who claim better crops without any ploughing at all. So "mechanized agriculture," like "the agricultural industry," can be a highly misleading expression.

There are, of course, other differences on which I need not dwell, such as the fact that farming is done in the open, with the weather as an uncontrollable and largely unpredictable factor, and that it consists of a multitude of small jobs rather than a few big ones. These characteristics have a direct bearing on the use of machinery.

Another misconception is that the use of machinery on farms is something new. The first threshing machine was invented in the late 18th century. The first reaper was evolved, incidentally by a Scottish clergyman, in 1826; and the complete reaper-and-binder (surely a triumph of human ingenuity) was in general use long before the end of the 19th century, as was the steam plough. Indeed, one can find in the farming publications of the mid-19th century the prototypes of many machines now appearing 100 years later as modern equipment. Nor has there, for several generations anyway, been much difficulty in persuading the countryman to use machinery. Like most of us, he enjoys playing with mechanical toys; and, being naturally resourceful and clever with his hands, he is better than many townsmen would be at effecting adjustments and emergency repairs.

Finally, there is the widespread belief—it is almost an article of faith—that mechanization "saves labour." Even as a general proposition, this seems questionable; so far as agriculture is concerned, I believe it be a myth. But of this more later.

Farm mechanization falls roughly into three periods. In the first, say the 19th century and up to the 1914-18 war, a great many machines—including the steam engine—were tried out and, by degrees, either assimilated or discarded. Then, between the wars, with the internal-combustion engine showing itself well adapted to many needs, machinery came increasingly into use as a means of relieving the growing scarcity of farm labour; in short, it was being developed as a substitute for human workers. Net production was at this

time declining, though this was masked by large imports of feedingstuffs for animals—another form of substitution. Finally, since 1939, this process of substitution has been employed on a very large scale, and at a rapid, almost reckless, pace, to extract a big increase in food supplies from our countryside without restoring to it its lost workers.

To some of you it may seem far-fetched to describe as substitutes the powerful and ingenious machines now at our disposal. But, apart from a few rather specialized jobs such as drain-digging, sub-soiling and land-clearance, there is hardly any work the machine can do that cannot be done better—and quite often more cheaply—by the skilled human worker and the trained draught animal. If you want to find the best examples of intensive food production, combined with a high level of soil fertility, it is not to the big mechanized farm one turns, but to the well-tilled garden or horticultural holding, where relatively little machinery is used. Similarly, the best-farmed areas in Europe (possibly in the world) are Denmark, Holland and certain parts of France and Germany, where the holdings are small and any machinery used is of a light and simple nature; nor is this good farming done at the expense of living standards, for these people live well, though they work hard. In the East again, an astonishing level of food production is achieved by the Japanese, Javanese and some of the Chinese, with their miniature fields tilled by hand or by buffalo.

But in this country, as in the United States, and to some extent in the Dominions, farming has had to live cheek-by-jowl with fast-expanding industries, and has felt the industrial impact very severely. In effect, industry has steadily drawn workers away from agriculture, and sold back to it manufactured substitutes in the form of machinery, chemical fertilizers and other industrial products. At the same time, industrial methods and urban ways of living have tended to become standards, or norms, for town and country alike. Thus it would, I think, be fair to regard farm mechanization as a by-product of an industrialized society rather than as an improvement originating within agriculture itself.

The social and economic consequences of the industrial impact on agriculture have of course been manifold and far-

reaching. It is an immense subject that has already been studied at great length. So I must confine myself here to some observations on the results of the most recent and intensive phase of mechanization, that is, since the beginning of the last war.

The first point that srikes one is that, so far as one can judge, it has *not* reduced labour costs, but rather increased them. This rather surprising outcome was clearly shown by a report issued jointly by the Economic Commission for Europe and F.A.O. in February of last year. This calculated that the operating cost (*not* capital expenditure) of farm machinery in the U.K. in the farming year 1951-52 was £127.5 mill. as compared with £18 mill. pre-war, a sevenfold increase, while wage labour costs had risen to £215 mill. from £56.5 mill., nearly a fourfold increase. Full allowance must be made, of course, for the fall in the value of money: but when the various costs are expressed as percentages of total farm outgoings, machinery costs are shown to have risen from 8 to 18 per cent. labour costs from 24 to 27 per cent. and the two together from 32 to 43 per cent., largely at the expense of rent and feedingstuffs.

It is perfectly true that output per person in agriculture has risen. But that is because output per acre has risen; and though machinery has undoubtedly contributed to this increase, there have been many other factors, not the least being the existence of assured markets at pre-determined prices. And there has to be taken into account the very considerable amount of labour represented by the manufacture and servicing of the machinery itself. Every machine has absorbed hundreds—in some cases, thousands—of man-hours before it even starts work; and it may work for only a few days a year.

The situation is well summarised by a report (No. 41) recently issued by the Farm Economics Branch of the Cambridge University School of Agriculture. After quoting an estimate that the volume of farm machinery has increased two-and-three-quarter times since 1939, the report observes:

"If machinery has served a useful purpose in increasing the amount of work performed per man, one would expect it to show in the form of more acres of crops cultivated and

more livestock tended per man employed. In these terms, the productivity of labour has increased by some 15 per cent. While such an increase is very well worth having, it seems small in comparison with the potentialities of the machinery used. A farm worker with a tractor can plough three, four or more times as many acres in a day as with a pair of horses. The use of a combine can reduce work in the harvest field to a quarter or less of that required for a binder. Against this background, the increase in work performance of 15 per cent. seems small. It would be even less impressive if account were taken of the additional man-hours spent in factories and repair shops in the manufacture and upkeep of this machinery."

So, summing up this last big burst of mechanization we can, I think say:

(i) that without it we should never have got the additional food we needed—and still need; but

(ii) that it has not resulted in any appreciable saving of labour or money, but, on the contrary, may well have increased production costs, because it has in effect transferred work from farm to factory, where labour costs more to maintain.

There are, however, a few supplementary observations to be made. The first is that, since 1939, the working hours of farm workers have been shortened and a fortnight's paid holiday introduced. Mechanization has certainly helped to make these possible.

The second is that it is infinitely easier to save man-hours on a particular job than to save man-years on a particular farm. Few farms employ more than a handful of men, and drastic changes have to be effected before even one can be dispensed with.

The third is that, since mechanization has been something of an emergency measure, we can reasonably expect greater efficiency as machines become better adapted to farm needs. But we are also beginning to hear the alternative—and much more questionable—proposition, namely that the farm must be adapted to the needs of and limitations of the machine. Now, ours is mostly mixed farming, and rightly so, since mixed farming makes best use of the land and best maintains

its fertility; but it is obviously expensive, and often uneconomic, to mechanize in every department. From an engineering and a purely financial point of view, specialization is the best way of making mechanization economic; but from the agricultural point of view, it is the wrong way, since it leads to more pests and diseases and to declining soil fertility. There are, similarly, grave objections to the amalgamation of farms to form larger units.

The fourth is that every machine seems to create a need for other machines. The replacement of horses by tractors means, sooner or later, a whole range of new implements. A combine-harvester necessitates further equipment for drying and storing the grain, and for collecting the straw. A pickup hay-baler calls for other machines to pick up the bales it makes and to lift them on to a stack. Thus mechanization tends to be both technically and financially cumulative, and the only way through that I can see for small farmers, who are the great majority, is some form of co-operation for some of the equipment, though contract work is performing a useful function.

It has been said that machinery should be used, not to displace men, but to make their labour more effective. I quite agree. But the implication is that there will always be opportunities for expanding production. Until quite recently, farmers have been able to carry a wage-bill four times the pre-war size, together with this additional mechanization cost of well over £100 million a year, by increasing output at guaranteed and rising prices. But with the present change in government policy, increasing output is, in many cases, to be penalized by the imposition of quantitative limitations to the guarantees; if farmers produce more, they are likely to get less for it. Some prices have already been reduced. To save themselves, farmers are almost bound to reduce their outgoings somewhere, even if it means a smaller output; and in many cases they are likely to find it easier to sack men than to scrap machines.

Finally, what are the effects of mechanization on men themselves and on the land? It is easy to exaggerate here and to indulge one's own imagination. Changes take place very slowly on the land, and the machine, as I have pointed

out, is no new factor. But even in my lifetime there has been, I think, a perceptible weakening of the natural ties (which is a broad interpretation of "interest") between the worker and his work, a gradual weakening of relationships in which the machine has certainly played a part.

It has, on balance, I feel sure, reduced that interest and militated against the development of human skills. True, it calls for certain skills of its own; but it tends to de-grade or displace others, including many which seem to me essential for an understanding of good husbandry. When corn is harvested with a binder, for instance, a good deal of art is involved in the setting up of stooks, in pitching and building loads, and in stacking and thatching—art which is strictly practical in the sense that it can save both effort and corn, and yet can be a source of legitimate pride. A. G. Street once wrote of a farmworker who, having built a lop-sided stack one day, paid his mates to come back with him that night (it being a full moon) to help him pull it down and re-build it. With the combine, the operator certainly has a skilled job, so has the man on the drier; but the rest is just donkey-work, lumping sacks and straw about.

One consequence of this change is that big mechanized farms tend to reduce staffs to a few key men and rely on casual labour for peak periods. A further consequence—rather an unexpected one—is that mechanical skills, being fairly easily acquired, have become commonplace, while the traditional husbandry skills now have scarcity value. Almost anyone over school-leaving age is regarded as fit to handle a tractor; but if you want a reliable stockman, or someone who can stack and hedge competently, you have to offer a good tied cottage and considerably more than the minimum wage; three-quarters of the vacancies advertized in the farming press are for men of this type. On some farms, stock have had to be given up altogether.

Fifty, even thirty, years ago, a well-run farm was a closely-knit and largely self-contained little society in which every worker—and every horse for that matter—had his own well defined place, for which he had developed a special aptitude. The farmworker of those days usually possessed no more than a few sticks of furniture; by modern standards

he was paid a miserable wage; his Union, even if he belonged to one, could do little for him. Yet he had, for all practical purposes, his recognised function in life, his own tools, his own beasts, a pride in his work and a stake in the farm, for he was an integral and an essential part of it. That relationship, that sense of belonging, had (and still has) a good deal more than sentimental value.

Today, the worker is being drawn out of that snug farm society into the larger, colder world of industrial relations. Indeed, his Unions are constantly claiming equality with industry in wages, with shorter hours and modern " untied " housing. They have not yet got all these things, I'm afraid; but there is no denying that, in a fully industrialized society, they are perfectly legitimate demands. But they mean, I rather think, that the farmworker, as such, is on the way out; for industrialized society seems unwilling to grant industrial rewards to its own food producers so long it can obtain food more cheaply from working farmers and peasants. Insofar as society—any society—needs rural occupations as an alternative and counter-balance to urban and industrial employment, that is a serious matter which may call for some radical changes in the agricultural structure.

Meanwhile, most farmworkers, I think, like mechanization. It enables the job to be done more quickly, if less thoroughly; it usually means a sitting job instead of a walking one (though that is not an unmixed blessing); it reduces week-end work; and, above all, it appears to confer something of an industrial status.

Most farmers seem to have drifted—or been pushed—into mechanization from necessity rather than choice; they see it primarily as the only way round what they call " the labour problem." It has been so much easier to buy more machines, using one's credit and claiming income tax allowance, than to find—and house—skilled workers. Some farmers are definitely mechanically-minded, giving more thought to their equipment than to their land. Others, I fancy, would be glad to go back to horses if they could get the men to work them, not necessarily because they are old-fashioned or sentimental, but because they are worried about the cumulative effect on their finances and on the soil.

No one quite knows yet what this last will be; but obviously you cannot repeatedly traverse the soil with heavy machinery without *some* effect on its structure. Possibly the adoption of ley farming, with its periods of humus-making grass, has reduced this risk; but certainly plough-pans and miniature dust-bowls are commoner than they were, and the risk of untimely tillage is quite real.

As I heard a soil specialist put it once: when you have to rely on horses and light implements, you have to work with the weather, because there is no other way of getting a seed-bed; but when you have powerful machinery at your disposal, you are tempted to try and force a tilth at times when you ought to keep off the land altogether. Moreover, when you are riding on a tractor, you are apt to concentrate on the mechanical side of things and fail to observe what is happening to the soil.

I have a feeling that in farming, as in politics, power tends to corrupt; in particular, it corrupts that sense of oneness with nature, of working with nature, that is the basis of good husbandry. It fosters the illusion that we can do what we like for so long as we can get away with it. The machine is not a product of the soil; it is not supported by the soil; it returns nothing to the soil; it is an alien element. As such, it can be an *intrusion* as well as a *substitute*, widening still further the rift between man and the rest of nature and exposing him to increasing spiritual as well as physical hazards.

I have heard it said that this gradual divorce of man from nature is forcing him to seek a closer relationship with God. Personally, I doubt this, and not only because I see in nature a manifestation *of* God. My own impression is that man is turning, not to God, but into himself, constructing from his own intellectual and technological achievements a secular form of Humanism. That is an issue, however, which I must forbear to discuss, having few qualifications for doing so. But it does seem to have brought us back to the point from which we started—are we justified in accepting uncritically such things as mechanization merely because they are represented to us as manifestations of human Progress?